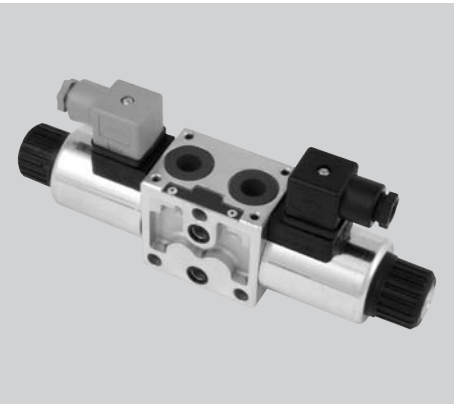
Rexroth
Bosch Group

4/3 4/2 Directional valve elements with proportional control and with or without LS connections



L8_80… (ED4-P)

Summary

General specifications

- Valve element with direct proportional control of spool
- Control spool operated by screwed-in solenoid with extractable coil
- In the de-energized condition, the control spool is held in the central position by return springs.
- Wet pin proportional tubes for DC coils, with push rod for mechanical override; nickel plated surface
- Manual override (push-button or screw type) available upon request
- Plug-in connectors available: EN 175301-803 (Was DIN 43650) and DT04-2P (Deutsch)

Ordering Details

L	8	_	8 0	_ _	S	_	_ _	_ _	_	0	_ _

Family
Directional valve elements ED

Type
Size 6, proportional

Configurations
Standard = 0
With Load Sensing control = 4

Coil type
D15

Spool variants [1]
4/3 operated both sides a and b;
P – T closed in neutral = B2
4/2 operated on side a only;
P – T closed in neutral = B3
4/2 operated on side b only;
P – T closed in neutraL = B4
4/3 operated on both sides a and b;
A and B to T in neutraL = E2
4/2 operated on side a only;
A and B to T in neutral = E3
4/2 operated on side b only;
A and B to T in neutral = E4

Flow pattern
Symmetrical

Nominal flow *
10 l/min (2.64 GPM) = 2
20 l/min (5.28 GPM) = 4
30 l/min (7.9 GPM) =6

* With Δp (P > T) 10 bar (145 PSI).

Optional fittings
_ _ = Without emergency
0F = Screw type emergency
0P = Push-button type emergency
_ _ = Lever type emergency [2]

Ports
3 = 3/4-16 UNF 2-B (SAE8)

Electric connection
00 = Without coils
01 = With coils, without connectors
02 = With coils and with non-assembled connector, type EN 175301-803
03 = With coils having AMP Junior connector
07 = With coils having DEUTSCH DT 04-2P connector*

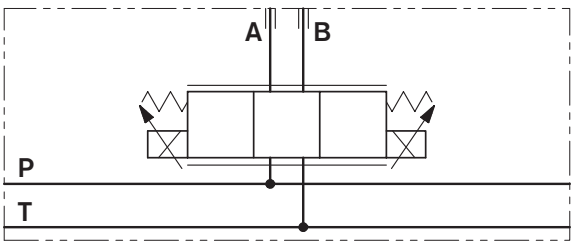
Voltage supply
00 = Without coils
OB = 12V DC
OC = 24V DC

07	03	02	01

Available connections

1) The required hydraulic symbol and spool variant can be chosen by consulting page 3.
2) Each different option for the type of emergency chosen implies a specific ordering code (refer to page 7).

Configurations



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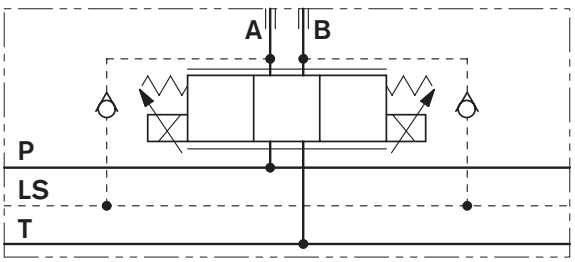
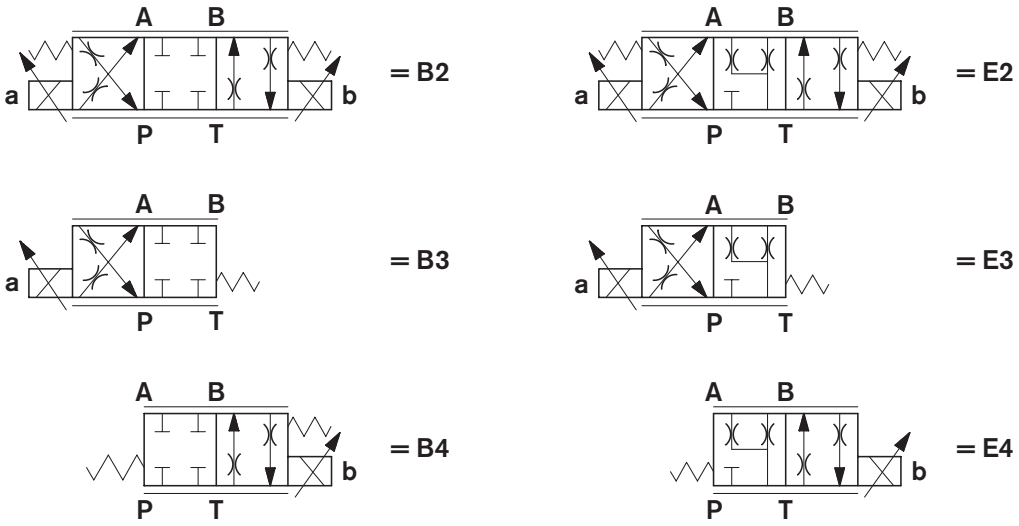


= 4

Spool variant

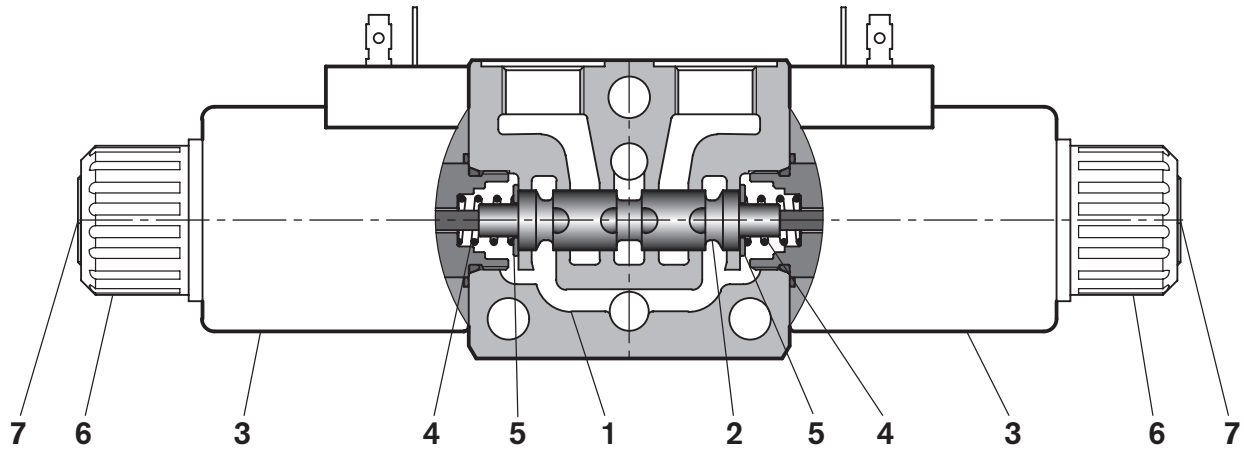


Principles of operation, cross section

The sandwich plate design directional valve elements L8080… are compact direct operated proportional solenoid valves which control the start, the stop, the direction and the quantity of the oil flow. These elements basically consist of a stackable housing (1) with a control spool (2), one or two solenoids (3), and one or two return springs (4).

Energized by an electronic feed regulator, each solenoid (3) displaces the control spool (2) from its neutral-central position “0” proportionally to the current received; a regulated oil flow P to A , or P to B, is achieved. Once the solenoid is de-energized, the return spring (4) pushes the spool thrust washer (5) back against the housing and the spool returns in its neutral-central position.

Each coil (3) is fastened to the solenoid tube by a ring nut (6). A pin (7) allows to push the spool (2) in emergency conditions, when the solenoid cannot be energized, like in case of voltage shortage.



Technical Data (for applications with different specifications consult us)

General

Valve element with 2 solenoids	kg (lbs)	2.20 (4.85)
Valve element with 1 solenoid	kg (lbs)	1.70 (3.75)
Ambient Temperature	°C (°F)	–20....+50 (–4....+122) [NBR seals]

Hydraulic

Maximum pressure at P	bar (PSI)	250 (3625)
Maximum dynamic pressure at T	bar (PSI)	210 [3050]
Maximum static pressure at T	bar (PSI)	250 [3625]
Maximum inlet flow	l/min (GPM)	45 (11.9)
Nominal flow with DP = 10 bar (145 PSI)	l/min (GPM)	10, 20, 30 (2.64, 5.28, 7.9)
Hydraulic fluid General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:		Mineral oil based hydraulic fluids HL (DIN 51524 part 1). Mineral oil based hydraulic fluids HLP (DIN 51524 part 2). For use of environmentally acceptable fluids (vegetable or polyglycol base) please consult us.
Fluid Temperature	°C (°F)	–20....+80 (–4....+176) [NBR seals]
Permissible degree of fluid contamination		ISO 4572: $\beta_x \geq 75$ X=12...15 ISO 4406: class 20/18/15 NAS 1638: class 9
Viscosity range	mm^2/s	20....380 (optimal 30....46)

Electrical

Voltage type		PWM	Power wave modulation pre-set at 120 Hz	
Voltage tolerance (nominal voltage)		%	–10 .... +10	
Duty			Continuous, with ambient temperature ≤ 50°C (122°F)	
Maximum coil temperature		°C (°F)	150 (302)	
Insulation class			H	
Compliance with			Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC	
Coil weight		kg (lbs)	0.335 (0.74)	
Voltage		V	12	24
Current [1]		A	1.76	0.88
Coil resistance [2]	– Cold value at 20°C (68°F)	Ω	4	16
	– Maximum hot value	Ω	6.1	24.4

Electronic control

Electronic feed regulators [3]	Upon request

1) Nominal 2) ± 7% at temperature 20°C (68°F)

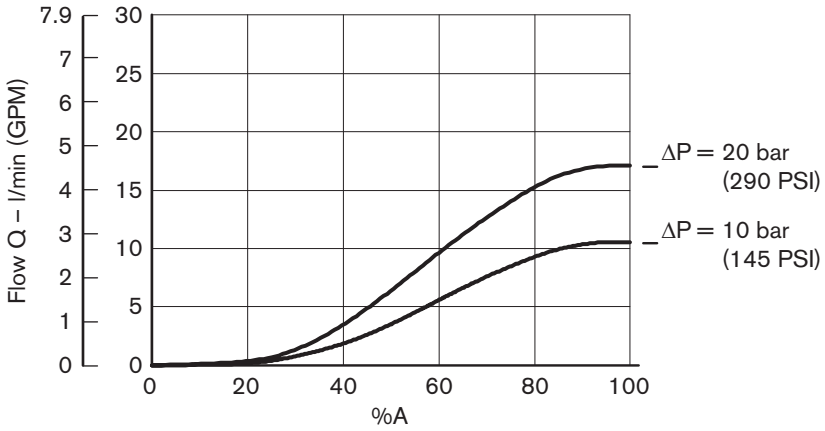
3) An electronic, open loop type, regulator with plug-in pins EN 175301-803 is available and can be fitted onto the solenoid directly. For valve elements with two solenoids, two electronic regulators are needed.

	Voltage (V)	Connector type	Coil description	Marking	Coil Mat no.
=OB 01 **=OB 02**	12 DC	EN 175301-803 (Ex. DIN 43650)	D15 01	12 DC	R933000092
=OB 03	12 DC	AMP JUNIOR	D1530	12 DC	R933002877
=OB 07	12 DC	DEUTSCH DT 04-2P	D15 07	12 DC	R933000094
=OC 01 **=OC 02**	24 DC	EN 175301-803 (Ex. DIN 43650)	D15 01	24 DC	R933000093
=OC 07	24 DC	DEUTSCH DT 04-2P	D15 07	24 DC	R933002798

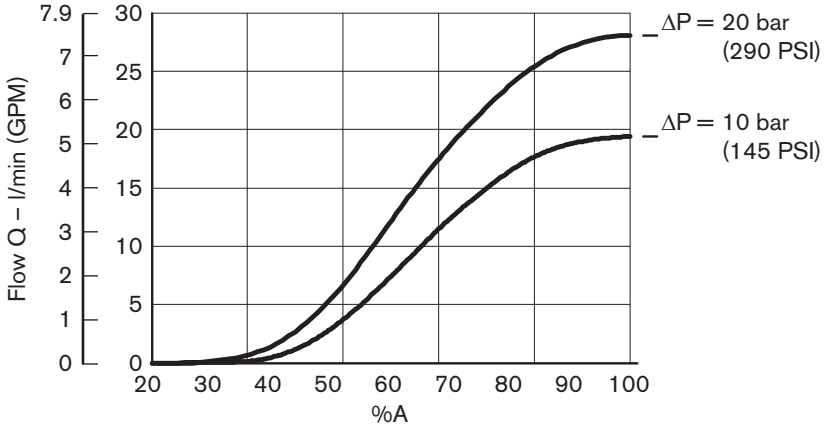
Characteristic curves

Measured with hydraulic fluid ISO-VG32 at 45° ± 5° C [113° ± 9° F]; ambient temperature 20° C [68° F].

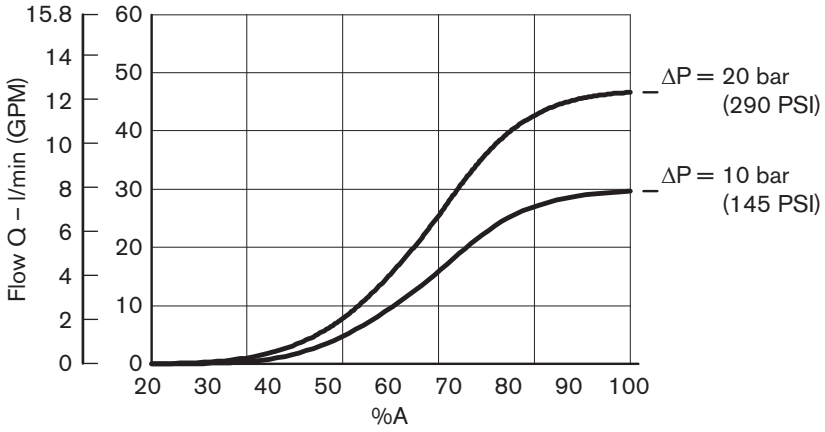
Ordering code 2: 10 l/min (2.64 GPM) with ΔP 10 bar (145 PSI)



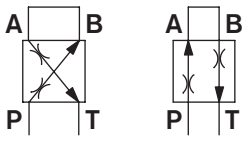
Ordering code 4: 20 l/min (5.28 GPM) with ΔP 10 bar (145 PSI)



Ordering code 6: 30 l/min (7.92 GPM) with ΔP 10 bar (145 PSI)

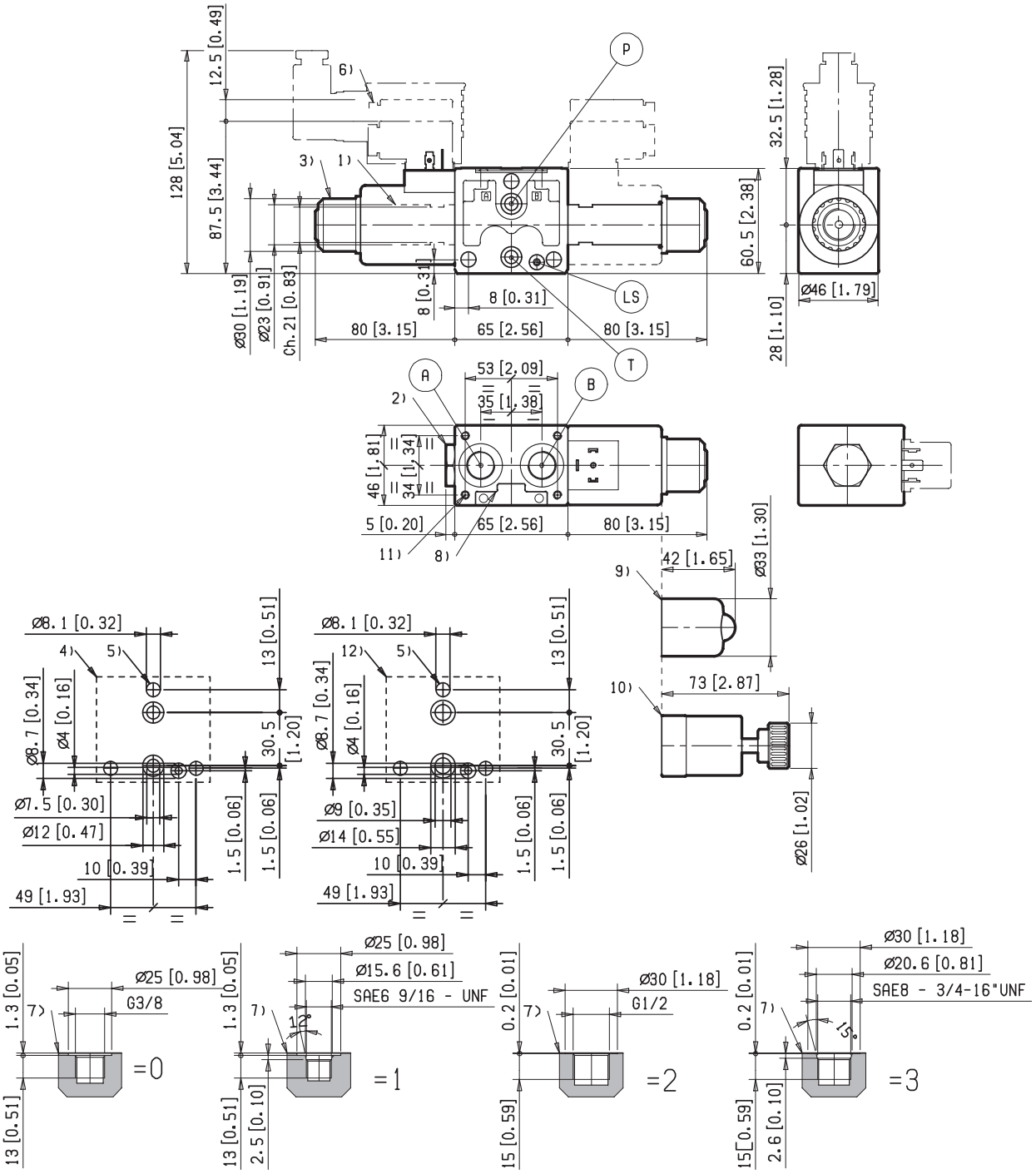


ΔP = is the actual one-way pressure drop across the open spool (inlet pressure minus outlet – port pressure)



The curves refer to the spool fully open

External Dimensions and Fittings



1 Solenoid tube key 21 mm. Torque 22–24 Nm (16.2–17.7 ft-lb).

2 Plug for 2 positions versions (4/2); hex 24 mm, torque 22–24 Nm (16.2–17.7 ft-lb).

3 Ring nut for coil locking (OD 30 mm); torque 6–7 Nm (4.4–5.2 ft-lb).

4 Flange specifications for coupling to ED intermediate elements with ports G 3/8 and SAE 6.

5 Three through holes for coupling of the ED Directional Valve Elements. Recommended tie rods M8 with strength class DIN 8.8. Torque 20–22 Nm (14.7–16.2 ft-lb).

6 Clearance needed for connector removal.

7 A and B ports.

8 Identification label.

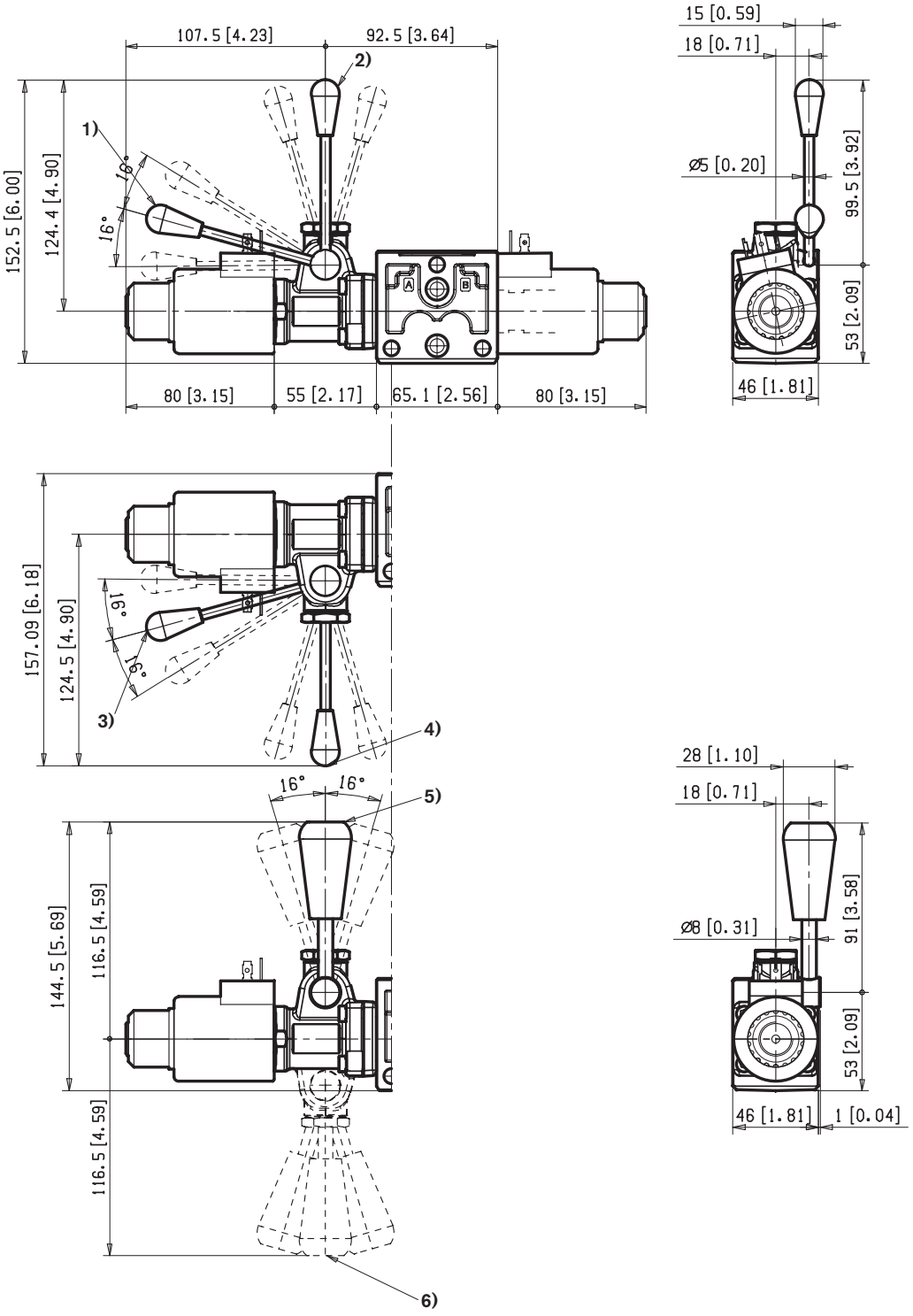
9 Optional push-button emergency, EP type, for spool opening: it is pressure stuck to the ring nut for coil locking. Material no. R933003289.

10 Optional screw type emergency, EF type, for spool opening: it is screwed (torque 6–7 [4.4–5.2 ft-lb]) to the tube as replacement of the coil ring nut. Material no. R933003116.

11 Four threaded holes M5 for fitting a secondary flangeable element (for elements with SAE 6 ports). Four threaded holes M6 for fitting a secondary flangeable element (for elements with SAE 8 ports). Bolts with recommended strength class DIN 8.8: torque 9–12 Nm (6.5–9 ft-lb).

12 Flange specifications for coupling to ED intermediate elements with ports G 1/2 and SAE 8.

External Dimensions and Fittings



1 Ordering Details: HA (if fitted to side A) or HB (if fitted to side B)

2 Ordering Details: VA (if fitted to side A) or VB (if fitted to side B)

3 Ordering Details: H1 (if fitted to side A) or H9 (if fitted to side B)

4 Ordering Details: V1 (if fitted to side A) or V9 (if fitted to side B)

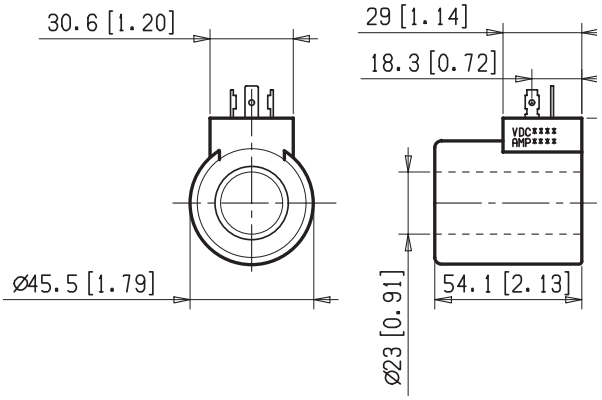
5 Ordering Details: XA (if fitted to side A) or XB (if fitted to side B)

6 Ordering Details: X1 (if fitted to side A) or X9 (if fitted to side B)

Electric connection (or connections, in case of two solenoids)

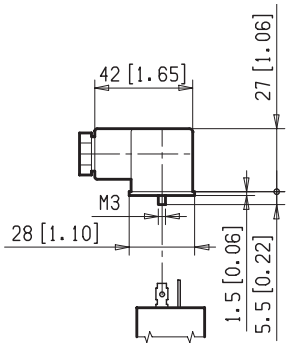
= 01

With coil having plug-in pins DIN 43650 – ISO 4400, without connector.
Protection class: IP 65 when connector with seal is properly screwed down.



= 02

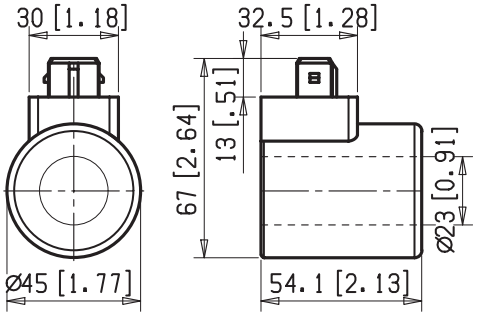
With coils and with connectors non-assembled, type DIN 43650 – ISO 4400.
Protection class: IP 65 when connector with seal is properly screwed down.



Material No.	Description
R933002885	182-09 GRAY
R933002889	182-09 BLACK

= 03

With coils having AMP Junior connector and with bi-directional diode.
Protection class: IP 65 with female connector properly fitted (see drawing).



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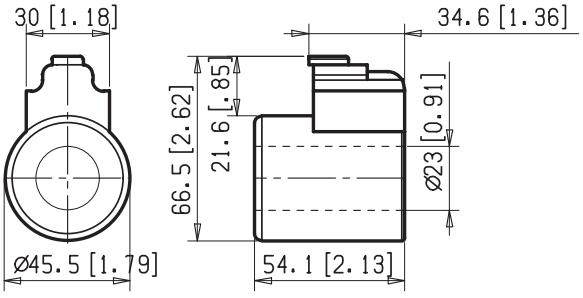
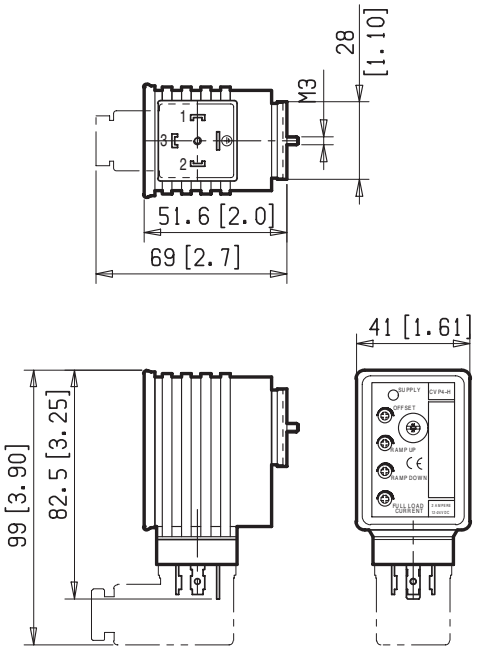
With coils having DEUTSCH DT 04-2P connector.
Protection class: IP 69 K with female connector properly fitted (see drawing).



Electronic feed regulator



Supply: yellow LED, lit up with power ON.

Off Set: minimum current adjustment. Adjust solenoid current so that the desired minimum value is obtained. Clockwise rotation increases current.

Ramp up: Ramping up time adjustment.

Ramp down: Ramping down time adjustment.
For longer ramping times, turn potentiometers clockwise; for shorter ramping times, turn the potentiometers counter-clockwise.

Full load current: Maximum current adjustment. Adjust solenoid current so that the desired maximum value is obtained (up to 2A). Clockwise rotation increases current.

Frequency adjustment: it is possible to set the PWM frequency obtaining the desired control sensitivity. After removing the external plastic cover, turn the adjusting screw; clockwise rotation increases frequency from 100 to 500 Hz.

Regulator ordering code	R933003290
Supply voltage	12-30 VDC
Control Signal	0–10 VDC
Max. output current	2 A
Minimum output current	0....0.6 A
Ramp adjustment up/down	0.1....10 s
PWM Frequency adjustment (pre-set 120 Hz)	100....500 Hz
Ambient operating temperature	–10....+60 °C (14....+140 °F)
Weight	0.12 Kg (26.4 lbs)
4 pins connector details	R933002888 (Gray) R933002890 (Black)
Electromagnetic compatibility	EN50081-1/2EN61000-4-2/3/4/5/6
Protection class with connector and seal correctly fitted and properly screwed down.	IP 65 (DIN40050 part 9)
Potentiometer resistance	5....10 k Ω

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